

Reference

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5 - 44 Effects on the Content of Flavonoids in *Scutellaria baicalensis* Georgi Irradiated by Carbon Ion Beams*

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The dry root of *Scutellaria baicalensis* Georgi (*S. baicalensis*) has the effects of clearing heat, dryness and dampness, purging fire and detoxification, calming the fetus according to Chinese Pharmacopoeia^[1]. Modern research has shown that it contains various active ingredients^[2], including flavonoids, phenylpropanoids, steroids, etc., which are the material basis for its medicinal effects. Among them, flavonoids, the main active ingredients, also affect the quality of *S. baicalensis*. Heavy ion beams have high linear energy transfer, which can induce higher mutation frequency and wider mutation spectrum of plants. At present, it is widely used in the breeding practice of crops and medicinal plants^[3,4]. And in modern medicinal plant breeding, one of the ideal goals is to improve active ingredients^[5]. However, the effects on the content of active ingredients, especially flavonoids, in *S. baicalensis* by heavy ion beams irradiation have not been reported.

In this study, the seedlings of *S. baicalensis* irradiated by carbon ion beams (CIB) grew in light cultivation room. After 9 weeks, the content of total flavonoids, baicalein and wogonin of *S. baicalensis* were measured (Fig. 1). The results showed that the content of total flavonoids increased by 14.69% and 25.32% at 10 and 30 Gy, respectively, while it decreased by 8.55% and 4.87% after 5 and 20 Gy radiation, respectively. And the content of baicalein and wogonin increased by 64.22% and 112.19% at 10 Gy, while the remaining doses had little impact on them. These results indicated that CIB radiation could promote the accumulation of active ingredients of *S. baicalensis* in a low dose. These results provided recommended doses for carbon ion beams radiation breeding of *S. baicalensis*.

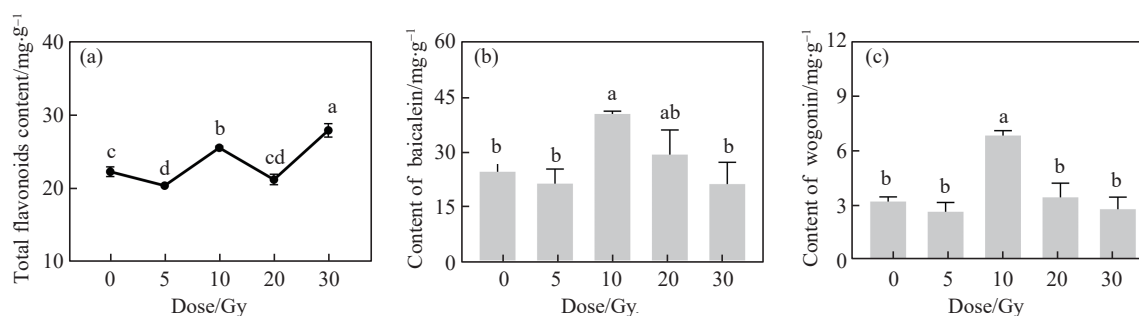


Fig. 1 (color online) Flavonoids content of *S. baicalensis* seedlings. (a) content of total flavonoids, (b) content of baicalein; (c) content of wogonin. ANOVA (Tukey) assay were used ($P < 0.05$) to examine the statistical significance of the results.

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